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10/792,083	03/03/2004	Hironori Kakiuchi	890050.467	4894

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EXAMINER	
MUHAMMED, ABDUKADER S	
ART UNIT	**PAPER NUMBER**
2627	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/792,083	KAKIUCHI ET AL.	
	Examiner	Art Unit	
	Abdukader Muhammed	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2004 and 06 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. In light of the explanation given by the applicants in the amendment filed on 06 August 2007, the objection made to the drawings in the office action mailed on 05 April 2007 has been withdrawn. The amendment also overcomes the objections made to the claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6 and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima et al. (US Publication 2002/0024913 A1).

Regarding Claim 1, Kojima et al. teach an optical recording medium comprising a support substrate (substrate 12; see figures 1 and 3) and a plurality of information recording layers (information recording layers 18 and 27; see figures 1 and 3), at least one information recording layer other than an information recording layer farthest from a light incidence plane through which a laser beam is projected comprising a first dielectric film, a second dielectric film and a recording layer disposed between the first dielectric film and the second dielectric film (a recording layer 18 is disposed between dielectric layers 16 and 20; see figures 1 and 3 and page 4, paragraph [0050], lines 3-6) and a thickness of at least one of the first dielectric film and the second dielectric film D2 is given as $D21<D2<D22$, D2 is a second smallest thickness among a plurality of thicknesses at which the dependency X of light transmittance of the at least one

information recording layer other than the information recording layer farthest from the light incidence plane on the wavelength of a laser beam locally becomes minimal and D21 and D22 are determined in such a manner that the dependency X of light transmittance of the information recording layer other than the information recording layer farthest from the light incidence plane on the wavelength of a laser beam is smaller than 1.2X2 when at least one of the first dielectric film and the second dielectric film has a thickness of D21 to D22, where X2 is the wavelength dependency corresponding to the second smallest thickness D2. In the instant application the optimal rage (D21<D2<D22) satisfying the above description is given in page 32, lines 15-17 as "the second dielectric layer 32 is formed so as to have a thickness of 100 nm to 130 nm and the first dielectric layer 34 is formed so as to have a thickness of 20 nm to 30 nm". Kojima et al. teach the first dielectric layer 16 with thickness of 110 nm and the second dielectric layer with thickness 22 nm; see page 10, paragraph [0114], lines 3-7.

Kojima et al. differ from the claimed invention in that they do not specifically show that the recording medium is a write-once recording medium. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the recording medium as write-once medium since in general a rewritable recording medium is developed from the write-once recording medium and the same structure is disclosed by rewritable medium only with additional characteristics.

Applicants' arguments filed on 06 August 2007 have been fully considered but they are not persuasive.

Applicants argue that claim 1 disclose a write-once type recording layer that is not disclosed by Kojima ret al.

Answer: the structure of claim 1 actually shows a general recording medium and not just a write-once recording medium. For it to show a write once structure the two recording films of the recording layer which are made from different metals have to be fused together irreversibly (see for example page 23, lines 2-7), which is not shown in the claim.

Applicants argue that "Kojima et al. do not disclose, teach, or suggest that thicknesses "D21 and D22 are determined in such a manner that the dependency X of light transmittance of the information recording layer other than the information recording layer farthest from the light incidence plane on the wavelength of a laser beam is smaller than 1.2-X2 when at least one of the first dielectric film and the second dielectric film has a thickness of D21 to D22, where X2 is the wavelength dependency corresponding to the second smallest thickness D2" as recited in claim 1."

Answer: according the *instant invention* "In a study done by the inventors of the present invention... when the at least one of the first dielectric film and the second dielectric film had a thickness of 100 nm to 130 nm, the dependency X of light transmittance of the information recording layer on the wavelength of a laser beam assumed the second local minimal value X2. Therefore, according to the present invention, it is possible to reduce the dependency X of light transmittance of an information recording layer other than an information recording layer farthest from a light incidence plane on the wavelength of a laser beam and prevent the information recording layer from being corroded." (See page 15, lines 13-24). This shows that whenever we have this given optimum thickness for at least one of the first dielectric film or the second dielectric film, the recording medium will have a characteristic in which the dependency X of light transmittance of the information recording layer assumes a second local minimum value

X2. Kojima et al. discloses this optimal thickness for at least one of the first dielectric film or the second dielectric film (the first dielectric film with a thickness of 110 nm; see page 3, paragraph [0114], lines 3-7), hence, even though this test was not disclosed by Kojima et al., the recording medium will show similar characteristic as described by claim 1.

Regarding Claim 2, as applied to claim 1 above and Kojima et al. further teach that the laser beam has a wavelength of 380 nm to 450 nm (wavelength of laser is 390 nm to 430 nm; see page 3, paragraph [0034], lines 11-14).

Regarding Claim 3, as applied to claim 1 above and Kojima et al. further teach that at least one of the first dielectric film and the second dielectric film is formed of a mixture of ZnS and SiO_2 (dielectric layers are formed from a mixture of Zns-SiO_2; see page 5, paragraph [0058], lines 10-12).

Regarding Claim 4, as applied to claim 2 above and Kojima et al. further teach that at least one of the first dielectric film and the second dielectric film is formed of a mixture of ZnS and SiO_2 (dielectric layers are formed from a mixture of Zns-SiO_2; see page 5, paragraph [0058], lines 10-12).

Regarding Claim 5, as applied to claim 3 above and Kojima et al. further teach that the light incidence plane is disposed on the side opposite to the support substrate with respect to the plurality of information recording layers (the light incidence plane is disposed on the side opposite to the support substrate 12; see figures 1 and 3), the first dielectric film is disposed on the side of the light incidence plane with respect to the recording layer and is formed of TiO_2 (the first dielectric flayer 16 is disposed form the light incidence side, see figures 1 and 3, and is

made from ZnO, TiO_2;see page 5, paragraph [0058], lines 3-7 for more lists) and the second dielectric film is disposed on the side of the support substrate and is formed of a mixture of ZnS and SiO_2 (the second dielectric layer 20 is disposed on the side of the substrate 12, see figures 1 and 3, and it is formed from a mixture of Zns-SiO_2; see page 5, paragraph [0058], lines 10-12).

Regarding Claim 6, as applied to claim 4 above and Kojima et al. further teach that the light incidence plane is disposed on the side opposite to the support substrate with respect to the plurality of information recording layers (the light incidence plane is disposed on the side opposite to the support substrate 12; see figures 1 and 3), the first dielectric film is disposed on the side of the light incidence plane with respect to the recording layer and is formed of TiO_2 (the first dielectric flayer 16 is disposed form the light incidence side, see figures 1 and 3, and is made from ZnO, TiO2;see page 5, paragraph [0058], lines 3-7 for more lists) and the second dielectric film is disposed on the side of the support substrate and is formed of a mixture of ZnS and SiO_2 (the second dielectric layer 20 is disposed on the side of the substrate 12, see figures 1 and 3, and it is formed from a mixture of Zns-SiO_2; see page 5, paragraph [0058], lines 10-12).

Regarding Claim 13, as applied to claim 7 above and Kojima et al. further teach that the first recording film contains Si as a primary component (the first recording layer 18 contains one element selected from Ag, Al, Si; see page 6, paragraph [0069], lines 5-7) and the second recording film contains Cu as a primary component (the second recording layer 27 contains one element selected from Au, Ag, Cu, Al, Ga; see page 7, paragraph [0074], lines 7-10).

Regarding Claim 14, as applied to claim 8 above and Kojima et al. further teach that the first recording film contains Si as a primary component (the first recording layer 18 contains one element selected from Ag, Al, Si; see page 6, paragraph [0069], lines 5-7) and the second

recording film contains Cu as a primary component (the second recording layer 27 contains one element selected from Au, Ag, Cu, Al, Ga; see page 7, paragraph [0074], lines 7-10).

Regarding Claim 15, as applied to claim 9 above and Kojima et al. further teach that the first recording film contains Si as a primary component (the first recording layer 18 contains one element selected from Ag, Al, Si; see page 6, paragraph [0069], lines 5-7) and the second recording film contains Cu as a primary component (the second recording layer 27 contains one element selected from Au, Ag, Cu, Al, Ga; see page 7, paragraph [0074], lines 7-10).

Regarding Claim 16, as applied to claim 10 above and Kojima et al. further teach that the first recording film contains Si as a primary component (the first recording layer 18 contains one element selected from Ag, Al, Si; see page 6, paragraph [0069], lines 5-7) and the second recording film contains Cu as a primary component (the second recording layer 27 contains one element selected from Au, Ag, Cu, Al, Ga; see page 7, paragraph [0074], lines 7-10).

Regarding Claim 17, as applied to claim 11 above and Kojima et al. further teach that the first recording film contains Si as a primary component (the first recording layer 18 contains one element selected from Ag, Al, Si; see page 6, paragraph [0069], lines 5-7) and the second recording film contains Cu as a primary component (the second recording layer 27 contains one element selected from Au, Ag, Cu, Al, Ga; see page 7, paragraph [0074], lines 7-10).

Regarding Claim 18, as applied to claim 12 above and Kojima et al. further teach that the first recording film contains Si as a primary component (the first recording layer 18 contains one element selected from Ag, Al, Si; see page 6, paragraph [0069], lines 5-7) and the second recording film contains Cu as a primary component (the second recording layer 27 contains one element selected from Au, Ag, Cu, Al, Ga; see page 7, paragraph [0074], lines 7-10).

Regarding Claim 19, Kojima et al. teach an optical recording medium comprising a support substrate (substrate 12; see figures 1 and 3) and a plurality of information recording layers (information recording layers 18 and 27; see figures 1 and 3), at least one information recording layer other than an information recording layer farthest from a light incidence plane through which a laser beam is projected comprising a first dielectric film, a second dielectric film and a recording layer disposed between the first dielectric film and the second dielectric film (a recording layer 18 on the light incidence side is disposed between dielectric layers 16 and 20; see figures 1 and 3 and page 4, paragraph [0050], lines 3-6), and at least one of the first dielectric film and the second dielectric film being formed of a mixture of ZnS and SiO_2 (dielectric layers are formed from a mixture of Zns-SiO_2; see page 5, paragraph [0058], lines 10-12) so as to have a thickness of 100 nm to 130 nm (at least the first dielectric layer 16 with a thickness of 110 nm; see page 10, paragraph [0114], lines 3-5).

Kojima et al. differ from the claimed invention in that they do not specifically show that the recording medium is a write-once recording medium. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the recording medium as write-once medium since in general a rewritable recording medium is developed from the write-once recording medium and the same structure is disclosed by rewritable medium only with additional characteristics.

4. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima et al. (US Publication 2002/0024913 A1) in view of Hintz (US 5,458,941).

Regarding Claims 7, 8, 9, 10, 11, and 12, Kojima et al. teach the limitations of claims 1, 2, 3, 4, 5, and 6 (respectively) for the reasons discussed above. Kojima et al. differ from the claimed invention in that the do not show the recording layer is constituted by a first recording film containing one element selected from the group consisting of Si, Ge, Sn, Mg, In, Zn, Bi and Al as a primary component and a second recording film containing one element selected from the group consisting of Cu, Al, Zn, Ti and Ag and different from the element contained in the first recording film as a primary component.

Hintz on the other hand teaches a recording medium with a recording layer having two adjacent layers/films 20 and 18 that fuse together when irradiated with light to form a recording mark 28 (see figure 1), and the first recording layer/film 18 may contain Al (see column 3, lines 53-60) the second recording layer/film 20 may contain Ge, Si (see column 3, lines 63-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two different recording films for one layer in the system of Kojima et al. since Hintz teaches that using two different recording films helps to create eutectic phase equilibria (see the abstract) which means for certain intermediate compositions of particular binary combinations of elements or compounds, the mixture will melt at a temperature considerably below the melting temperature of either constituent by itself (see column 2, lines 33-45).

Conclusion

5. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Mizushima et al. (US 2004/0174796 A1) teach an optical recording medium that has two films for one recording layer that fuse together upon irradiation (see figures 1-2).

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) Will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdukader Muhammed whose telephone number is (571) 270-1226. The examiner can normally be reached on Monday-Thursday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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16 August 2007

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER